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plax; 3. Give detailed statements of the habits and life-history of the species chosen, based on original and careful experiments and observations; 4. Suggest a plan for breeding the insects in large numbers, with a sketch of apparatus, and estimated cost of producing them per thousand; 5. Formulate a plan for using the insects in the larva, pupa, or perfect state for the destruction of mosquitoes and flies, (a) in houses, (b) in cities, (c) in neighborhoods.

The prizes will be awarded after careful consideration by Dr. Henry C. McCook, vice-president of the Academy of Natural Science of Philadelphia, and vice-president of the American Society of Entomologists, and Dr. J. S. Newberry, president of the New York Academy of Sciences, professor of geology of Columbia College, and late chief of the Geological Survey of Ohio.

In awarding the prizes, clearness of statement obtained by accompanying sketches, and new and purely scientific facts in the life-history of the *Libellulidae*, of which so little is known, will be duly considered.

All the essays received may be published wholly or in part, at the discretion of the judges, and full credit will in all cases be given to each observer.

The essays should be forwarded by Dec. 1, 1889, to Mr. J. H. Winsor, at the American Museum of Natural History, 77th Street and 8th Avenue, New York, to whom all communications should be addressed.

ROBERT H. LAMBORN.

32 Nassau Street, New York, July 15.

Are Beech-Trees ever struck by Lightning?

REFERRING to note on p. 7 of *Science* for July 5, and letter on p. 50, July 19, I here record some observations on the same subject. During a prolonged summer drought, about one o'clock P.M., the sun was shining brightly, but a small cloud came from the south-east; and while two other gentlemen and I were seated in my parlor, conversing, a flash was seen, and a sharp explosion heard. In a few moments a man came in, announcing that he had been thrown from the wagon, the driver knocked down, also five of the six oxen, "three of which were killed by lightning." Hastening to the spot, about two hundred feet from the parlor, we found the wagon under the branches of a large beech-tree a few feet from the trunk, the wheels in contact with roots, the fore-wheels having passed the trunk; the oxen all recovered and standing, save the farthest one from the tree. He was dead, and never moved a muscle. The messenger was seated on the hinder part of the wagon when struck and knocked down. The driver walking on the opposite side of the tree, perhaps ten feet from the trunk, but some of the spreading branches almost touching his head, was knocked down, somewhat stunned, and, although standing on our arrival, had not fully regained his wits, nor his hat.

The tree was tall, and thickly branched to the top. On careful and minute examination, we found no mark of electricity on trunk, root, or branch; but later we discovered, perhaps twelve or more feet from the top, a space about three inches wide and six or eight feet long, as we guessed, from which the bark was torn and the wood grooved. Some days later we discovered that a strip of bark extending from the rent above mentioned to the earth was dead and peeling off, and the wood grooved. Our conclusion was that the electricity mostly passed between the bark and the wood, there being most moisture at plane of contact. Not a drop of rain fell during the day, nor during many weeks before and after the above incidents.

This is by no means the only instance in which I have known the beech-tree struck by lightning, nor the only one in which the electricity seemed, at least, to pass between bark and wood of beech, oak, tulip-tree, black gum, *Magnolia grandiflora*, etc.

Why was neither man killed in this instance, and only the ox farthest from the stricken tree? The explanation is simple enough. Here was a ridge gently sloping to the east, west, and south. The stricken tree was perhaps twenty feet from the lowest western level. One ox had placed one foot on the lowest spot of ground which it is presumed was near moisture beneath (the rest of the land being dried, and on the crest of the ridge to such a depth as to cause the death of several trees): the circle from moist earth through the ox, the chains, and iron of the wagon, was completed to the tree. One of the two oxen nearest the tree did not fall. All the phenomena caused me to think that the discharge was *from* the earth.

Having had many extraordinary, very undesirable, and extremely dangerous opportunities of witnessing phenomena of natural electricity, other facts may possibly be given later. D. L. PHARES.

Madison Station, Miss., July 24.

Breathing.

MY attention has recently been called to your editorial comments on my observations made on the chest-movements of some eighty Indian females about two years ago, from which I felt justified in concluding that the abdominal was the original type of respiration in woman, and that the costal type has been acquired through the influence of abdominal constriction. Now, although this observation and conclusion was confirmed more recently by the experiments of Dr. Kellogg, who measured the chest-movements of a number of Chinese women in the Far West whose abdomens were never constricted by artificial appliances, you incline to the belief that "the question of what is the natural type of respiration may still be regarded as *sub judice*, unless (which perhaps may be the truth) both types are natural under varying conditions independent of dress," because "other observers, notably Hutchinson in his examination of twenty-four girls whose waists had never been constricted by corsets or other appliances, found the costal type present."

With the highest regard for your opinion, I beg to say that such a deduction is scarcely allowable from the premises of my researches. These show, in all probability, that Dr. Hutchinson's girls were not entirely free from the influence of abdominal constriction, even though they never wore corsets: for in the Indian the abdominal type obtains the highest form of development in the full-blooded girl, whose body, as well as the bodies of her ancestors, has never been subjected to the influence of abdominal constriction; and this type seems to disappear from the Indian girl in the proportion of the admixture of white blood in her veins. It is very probable, therefore, that heredity is an important factor in the maintenance of women's breathing; and any experiment or deduction which fails to give this due consideration will naturally lead to final disappointment.

So far as I know, Dr. Kellogg's and my own experiments are the only efforts which have been made to solve this problem by studying the respiratory movements in their most primitive condition in woman, and, until they are disproved by experiments based on identical conditions, I think they must be taken as conclusive.

THOS. J. MAYES.

Philadelphia, July 29.

Exchanges.

[Exchanges are inserted for subscribers free of charge. Address N. D. C. Hodges, 47 Lafayette Place, New York.]

Lead, zinc, mundic, and calcite. — Lulu Hay, secretary Chapter 350, Carthage, Mo.

I will sell to chapters or individual members of the Agassiz Association, 25 fine specimens of fossil plants from the Dakota group (cretaceous), correctly named, for \$2.50. Send post-office order to Charles H. Sternberg (author "Young Fossil-Hunters"), 1033 Kentucky Street, Lawrence, Kan.

One mounted single achromatic photographic lens for making 4 × 5 pictures, in excellent condition; also one

"new model" double dry-plate holder (4" × 5"), for fine geological or mineralogical specimens, properly classified. — Charles E. Frick, 109 West Lehigh Avenue, Philadelphia, Penn.

Drawings from nature — animals, birds, insects, and plants — to exchange for insects for cabinet; or I will send them in sets of ten each for ten cents in stamps. My drawings in botany are in detail, showing plant, leaves, flowers, seed, stamens, pistils, etc. — Alda M. Sharp, Gladbrook, Io.

The undersigned wishes to make arrangements for the exchange of *Lepidoptera* of eastern Pennsylvania for those from other localities. All my specimens are named and in good condition. — Charles S. Westcott, 613 North 17th Street, Philadelphia, Penn.

California onyx, for minerals and coins not in my col-

lection. — W. C. Thompson, 612 East 141st Street, New York, N.Y.

Will such members of the Agassiz Association as botanize this summer, and can afford time, please observe for me any case of doubling in any flower and in any locality, stating name of flower (Gray), the abnormal change, the time and place found, and whether monstrosity is abundant or otherwise? Please address communications to Will G. Cole, 3643 Prairie Avenue, Chicago, Ill.

Any one who has a botanical box in good condition will please write. I will offer about 10 specimens in exchange. — C. B. Haskell, Box 826, Keamsburg, Pa.

A few first-class mounted birds, for first-class birds' eggs of any kind in sets. — J. P. Babbitt, secretary Chapter 755, 10 Hodges Avenue, Taunton, Mass.